REMARKS/ARGUMENTS

Claims 1-16 stand rejected in the outstanding Official Action. Claims 1, 2, 5-8, 15 and 16 have been amended and therefore claims 1-16 remain in this application.

The Examiner's acknowledgment of Applicants' claim for foreign priority and receipt of the certified copies of the priority document is very much appreciated. Additionally, the Examiner's consideration of the prior art disclosed in Applicants' previously submitted Information Disclosure Statement is appreciated. Unfortunately, there was not indication of the acceptability of the previously filed formal drawings. The Examiner is requested to advise Applicants as to the PTO position regarding the acceptability of the originally filed formal drawings.

On page 2 of the outstanding Official Action, claims 1-16 stand rejected under 35 USC §112 (second paragraph) as allegedly being indefinite. The claim terms "fibre-optic point sensors" and "distributed fibre-optic sensor" are terms of art that would be well known to those of ordinary skill in the fiber optic sensor art. For example, Applicants submit a photocopy of "Optical Fibre Sensor Technology" edited by K.T.V. Grattan and B.T. Meggitt, 1999, ISBN 0412782901, page 4, where it is stated:

> Further scope for classification of sensors exists using a basis of whether the sensor is making a single point measurement i.e. a specific measurement at a particular point in space, or offers the possibility of distributed measurement, such as can be achieved with the use of optical time domain reflectometry (OTDR).

Not only are these claim terms well known to those of ordinary skill in the art, examples of such claimed elements are disclosed in Applicants' specification. The Examiner's attention is directed to page 6, lines 15-20, in which examples of "fibre-optic point sensors" such as

geophones are described as being "approximately 100m of optical fibre wound onto a flexural disc, and is able to measure acceleration and displacement via strain induced in the fibre." A "distributed fibre optic sensor" is disclosed as comprising "100m of optical fibre packaged within a cable and can measure pressure on, or bend of, the cable, also via strain induced on the fibre." Additionally, applicants' Figure 1 clearly shows separate point sensors (16A-16N) connected by sections of distributed fiber optic sensor (18B-18N).

In view of the discussion in the book "Optical Fibre Sensor Technology" as noted above, the terms "fibre-optic point sensor" and "distributed fibre-optic sensor" were well known to those of ordinary skill in the art well before the filing date of Applicants' GB priority application on September 24, 2003. However, even if these terms were not well known to those of ordinary skill in the art, they are clearly defined in Applicants' specification and drawings and examples thereof were provided. While Applicants' claims are not limited to the disclosed examples, the examples clearly indicate the subject matter of these claim terms and any further rejection of claims 1-16 under 35 USC §112 is respectfully traversed.

Claims 1-16 stand rejected under 35 USC §103 as being unpatentable over Yurak (U.S. Patent 5,140,154). It is noted that Yurak is a reference submitted with Applicants' previously filed Information Disclosure Statement and was well known to Applicants upon preparation of the initial application.

A careful review of the Yurak reference will disclose that while Yurak does use a plurality of point sensor units 30' "separated by a coil delay element 10a" (column 4, lines 12-20), Yurak fails to disclose any "distributed fibre-optic sensor." As a result, Yurak fails to disclose all claimed elements set out in independent claim 1.

Additionally, Yurak fails to teach the claimed interrelationship between claim elements, i.e., the fact that the distributed fibre-optic sensor links the at least two fibre-optic point sensors.

The Examiner contends on page 3 of the Official Action that "the delay element **could be considered** as a distributed fiber optic sensor" (emphasis added). There is believed to be no support for the Examiner's contention contained in the Yurak reference. There is no indication anywhere in Yurak which suggests that the delay elements somehow operate as a "distributed fibre-optic sensor." Should the Examiner believe there to be any suggestion in the Yurak reference, he is respectfully requested to identify the column and line number of this suggestion.

Should the Examiner contend that the disclosed "delay elements 10a" inherently operate as a distributed fibre-optic sensor, she is respectfully requested to identify appropriate documentation establishing this mode of operation of the disclosed delay elements. Absent some specific teaching that the Yurak delay elements operate in the manner of Applicants' claimed "distributed fibre-optic sensor" and the fact that this would be well known to those of ordinary skill in the art, there is simply no support for the Examiner's conclusion.

Moreover, the fact that the Examiner admits that the delay element "could be" considered does not indicate a teaching in Yurak, and, in fact, is an admission that Yurak does not disclose that the delay element comprises a "distributed fibre-optic sensor." "Could be considered" is simply not the test of obviousness. As the Court of Appeals for the Federal Circuit has consistently held, the burden is on the Examiner to disclose where each claimed element and each claimed interrelationship between elements is disclosed in one or more prior art references. Specifically, the Court of Appeals for the Federal Circuit has held that "the PTO has the burden under Section 103 to establish a *prima facie* case of obviousness." *In re Fine*, 5 USPQ2d 1596,

1598 (Fed. Cir. 1988). "It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references."

This failure to meet the above burden is one requirement of establishing a *prima facie* case of obviousness. Here, because the Examiner has not identified any teaching of the claimed "distributed fibre-optic sensor," there is simply no *prima facie* basis of obviousness and any further rejection of claim 1 or claims dependent thereon is respectfully traversed.

Regarding method claims 15 and 16, it is noted that the Yurak reference does not teach any analysis of optical signals received from a "distributed fibre-optic sensor." Thus, Yurak not only fails to teach the method step of positioning a fibre-optic sensor array according to claim 1, but it also fails to teach the analyzing of optical signals received from the array to establish the position of an object crossing the path of the sensor array.

Yurak, as disclosed, could only disclose the position of an object crossing its sensor array if the object passes over or relatively nearby one of the fiber optic point sensors 30A. If the object passed between sensor units 30', there is no indication that Yurak's delay element 10A would provide any indication of the path being crossed. Accordingly, the Examiner's allegation that the claimed method steps are "inherently shown by the Yurak et al reference" is respectfully traversed.

The Examiner also alleges in the first paragraph on page 4 that the preamble of a claim is denied effect and cites for support, *Kropa v. Robie*, a Court of Customs and Patent Appeals decision more than 50 years old. The Examiner's attention is directed to Section 2111.02 of the Manual of Patent Examining Procedure (MPEP) which states that "in claims directed to articles

and apparatus, any phraseology in the preamble that limits the structure of the article or apparatus must be given weight," with the MPEP citing *In re Stencel*, a more recent 1987 Federal Circuit case. To the extent that claims 1-14 recite fibre-optic sensor arrays and/or a fibre-optic surveillance system, that phraseology, to the extent that it limits the structure of the elements and their interconnection, "must be given weight."

Applicants have amended independent claim 1 and dependent claims 2, 5-8, 15 and 16 to eliminate minor inconsistencies and to place them in a form more compatible with U.S. patent examining practices. As such, claims 1-16 are believed to be clearly allowable over the Yurak reference.

Having responded to all objections and rejections set forth in the outstanding Official Action, it is submitted that claims 1-16 are in condition for allowance and notice to that effect is respectfully solicited. In the event the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of the above claims, she is respectfully requested to contact Applicants' undersigned representative.

Respectfully submitted,

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Attachment:
Page 4, "Optical Fibre Sensor Technology" and advertisement sheet

multi-mode and in particular in the relation to interferometric sensors, the temporal degree of coherence of the light in the sensor itself is important, as to whether it be high coherence, low coherence or even incoherent light, which will make a difference to the operation of the device. This distinction arises from the different optical sources used in the sensors themselves.

It is useful to consider the use of several different schematic representations to enable these distinctions to be seen more clearly. Following the pattern of Udd [6], a tree representing subdivisions of both extrinsic and intrinsic fiber optic sensors is shown in Figures 1.2 and 1.3, with Figure 1.4 reflecting the degree of diversity of the subdivision of interferometric fiber optic sensors. The devices considered are intrinsically totally passive sensors, i.e. those which do not require electric power at the sensor head, although a separate group of hybrid sensors exists including bulk, micro-optic or integrated optic elements where an additional power source is used, for example when local electrical powering is provided, often using transduction from optical radiation at the sensor head itself.

In order to be aware of and examine the diversity of the use of fiber optic sensors more fully, the wide range of measurements which can be addressed by fiber optic sensors can be seen, as is tabulated in Figure 1.5 from the work of Jackson [7] where the use of different types of fibers to measure a number of parameters is revealed. This is complemented by Figure 1.6 from the work of Spooncer [3] showing an illustration of the subcategories of one specific group, i.e. multi-mode OFSs in terms of intensity, wavelength or time modulation, as examples.

Further scope for classification of sensors exists using a basis of whether the sensor is making a **single point measurement** i.e. a specific measurement at a particular point in space, or offers the possibility of **distributed measurement**, such as can be achieved with the use of optical time domain reflectometry (OTDR)

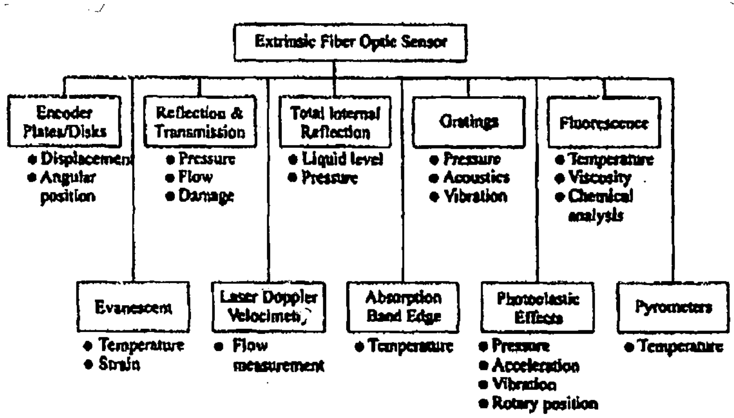
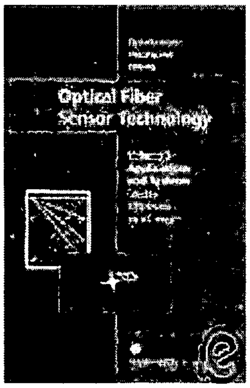


Fig. 1.2 Extrinsic fiber optic sensor applications (after Udd, 1991).



Optical Fibre Sensor Technology: Applications and Systems

Author(s): Grattan, K. T. V.; Meggitt, B. T.
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eVIP Price $182.18
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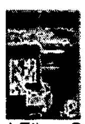

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Synopsis

Concentrates on the applications of optical fiber sensor technology and systems that rely upon it with a particular emphasis on physical sensors.

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